DOCUMENT RESUME

ED 458 790 EF 006 016

TITLE	Minimum School Space Requirements.
INSTITUTION	Arizona State School Facilities Board, Phoenix.
PUB DATE	2000-09-11
NOTE	11p.
PUB TYPE	Legal/Legislative/Regulatory Materials (090)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*Design Requirements; *Educational Facilities Design; Elementary Secondary Education; *Interior Space; Public Schools; *School Space
IDENTIFIERS	*Arizona

ABSTRACT

This document presents methods for determining minimum school space requirements for Arizona public school classrooms; libraries and media centers; cafeterias; auditoriums and other multiuse space; science, art, vocational education, and physical education space; and non-educational areas. The space requirements are based on the following documents adopted in 1999 by Arizona's School Facilities Board: the Building Adequacy Guidelines; the Further Delineation and Explanation of the Building Adequacy Guidelines; and Exhibit A (Equipment List). (GR)

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Arizona State School Facilities Board
Minimum School Space Requirements

ED 458 790

The following information is provided to assist in determining minimum school space requirements based on the **Building Adequacy Guidelines,** the **Further Delineation and Explanation of the Building Adequacy Guidelines,** and **Exhibit A (Equipment List)** documents, all modified and adopted by the School Facilities Board in November, 1999. These three documents are available in the Forms and Documents section of the Arizona School Facilities Board web-site (*www.sfb.state.az.us*), or may be obtained by mail or fax by contacting the SFB offices at 602.542.6501.

The information provided below is based on Articles 3, 4, 5, 6, 9, and 10 of the Guidelines, and the corresponding sections of the Delineation Document and Equipment List. Included are minimum space requirements for: 1) academic classroom space; 2) libraries and media centers; 3) cafeterias; 4) auditoriums and other multi-use space; 5) science, art, vocational education, and physical education space; and 6) other types of school facility areas.

1. Academic Classroom Space (Guidelines Article 3)

The minimum amount of cumulative classroom square footage per student is specified in Section R7-6-301 of the Guidelines as follows:

Grade Configuration	Sq. Ft. per Student
Preschool with disabilities, kindergarten, and grades 1-3	32 sq. ft.
Grades 4-6	28 sq. ft.
Grades 7-8	26 sq. ft.
Grades 9-12	25 sq. ft.

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For purposes of measuring cumulative classroom square footage, a factor is applied to the total amount of space usable for general and/or specialty classroom purposes. Section R7-6-301 defines these factors as follows:

Grade Configuration	Factor
Preschool with disabilities, kindergarten, and grades 1-6	100% of general classroom space
Grades 7-8	90% of general and specialty classroom space
Grades 9-12	85% of general and specialty classroom space

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The Guidelines provide minimum standards for the number of square feet required for each student, and guidelines for calculating that square footage based on classroom utilization factors. It should be noted that the Guidelines do not specify how many actual classrooms are required for a school facility. However, based on the Guidelines and related documents, following are examples of two methods which can be used as a guide to determine the number of classrooms which should be included when designing a new school facility:

A. **Method One** (gross square footage)

Method one is based on the gross square footage approved for the new school facility, divided by the minimum square feet per student (per statute) to determine the maximum student capacity of the school. The maximum student capacity of the school facility is then used to determine the number of classrooms needed for the facility, based on the cumulative classroom square footage requirements per student noted in the above table.

Elementary School Example (K-6) - assume an 800 student K-6 school has been approved by the Board. The district would receive 72,000 square feet of space (90 square feet per student x 800 students = 72,000 square feet). By statute, this 72,000 square foot school would have a maximum capacity of 900 students (72,000 square feet ÷ 80 square feet per student = 900 students). As noted in the table above, elementary schools utilize a 100% factor in calculating cumulative classroom square footage.

Based on the minimum square footage per student from the table above, and assuming that classrooms are designed at 900 square feet, K-3 classrooms would accommodate 28 students (900 square feet ÷ 32 square feet per student = 28 students), and 4-6 classrooms would accommodate 32 students (900 square feet ÷ 28 square feet per student = 32 students).

Assuming equal distribution of students over all grade levels, the 900 student capacity facility would have 129 students per grade level (900 students ÷ 7 grade levels = 129 students). At 129 students per grade level, the facility would need 5 classrooms per level for grade levels 1-3 (129 students ÷ 28 students per classroom = 4.6 [5] classrooms), 4 classrooms per level for grade levels 4-6 (129 students ÷ 32 students per classroom = 4 classrooms), and 3 kindergarten classrooms (half of the number required for grade levels 1-3, or 2.3 [3]).

In summary, the example facility would require a minimum of 30 general use classrooms based on the above calculations - 3 kindergarten, 15 grade levels 1-3, and 12 grade levels 4-6. Obviously, there are many variables in these calculations which could impact the number of classrooms required by the district. For example, if the classrooms were smaller or larger than 900 square feet, or if the district had a policy of no more than 25 or 30 students per classroom, the required number of classrooms would vary.

Middle School Example (7-8) - assume a 1,000 student 7-8 school has been approved by the Board. The district would receive 100,000 square feet of space (100 square feet per student x 1,000 students = 100,000 square feet). By statute, this 100,000 square foot school would have a maximum capacity of 1,250 students (100,000 square feet ÷ 80 square feet per student = 1,250 students). As noted in the table above, middle schools utilize a 90% factor in calculating cumulative classroom square footage.

Based on the minimum square footage per student from the table above, and assuming that classrooms are designed at 900 square feet, 7-8 classrooms would accommodate 35 students (900 square feet ÷ 26 square feet per student = 35 students).

The facility's capacity of 1,250 students with 35 students per classroom as noted above, calculates into 36 classrooms (1,250 students ÷ 35 per classroom = 35.7 [36]). Factoring in the 90% utilization factor used to calculate cumulative classroom square footage for a 7-8 middle school, the facility would be required to have 40 classrooms, or 36,000 square feet of combined general and specialty classroom space.

As with the elementary school example, there are many variables in these calculations which could impact the number of classrooms required by the district. For example, if the classrooms were smaller or larger than 900 square feet, or if the district had a policy of less than 35 students per classroom, the required number of classrooms would vary.

High School Example (9-12) - assume a 2,000 student 9-12 school has been approved by the Board. The district would receive 250,000 square feet of space (125 square feet per student x 2,000 students = 250,000 square feet). By statute, this 250,000 square foot school would have a maximum capacity of 2,660 students (250,000 square feet ÷ 94 square feet per student = 2,660 students). As noted in the table above, high schools utilize an 85% factor in calculating cumulative classroom square footage.

Based on the minimum square footage per student from the table above, and assuming that classrooms are designed at 900 square feet, 9-12 classrooms would accommodate 36 students (900 square feet ÷ 25 square feet per student = 36 students).

The facility's capacity of 2,660 students with 36 students per classroom as noted above, calculates into 74 classrooms (2,660 students ÷ 36 per classroom = 73.9 [74]). Factoring in the 85% utilization factor used to calculate cumulative classroom square footage for a 9-12 high school, the facility would be required to have 87 classrooms, or 78,300 square feet of combined general and specialty classroom space.

As with the other examples above, there are many variables in these calculations which could impact the number of classrooms required by the district. For example, if the classrooms were smaller or larger than 900 square feet, or if the district had a policy of less than 36 students per classroom, the required number of classrooms would vary.

B. **Method Two** (number of students)

Method two is based on the number of students for which the new school facility is approved divided by the state-wide average number of students per classroom, which in turn is based on a state average student teacher ratio for grade levels as follows:

- 25 students per K-3 classroom
- 28 students per 4-12 classroom
- 20 students per pre-school handicapped classroom
- 15 students per special education classroom

Elementary School Example (K-6) - using the elementary school example from method one above, the 800 student school would have 129 students per grade level. As noted in the table above, elementary schools utilize a 100% factor in calculating cumulative classroom square footage.

At 129 students per classroom, using the state-wide average number of students noted above indicates a need for 15 1-3 classrooms (129 students ÷ by 25 students per classroom = 5.2 [5] x 3 grade levels), 3 kindergarten classrooms (half of the number required for grade levels 1-3, or 2.6 [3]), and 15 4-6 classrooms (129 students ÷ by 28 students per classroom = 4.6 [5] x 3 grade levels), for a total of 33 general use classrooms.

As noted in the introduction to this section, the Guidelines specify the minimum number of square feet of classroom space required per student. The total number of classrooms calculated by this method must at least equal the required square footage specified in the Guidelines.

Middle School Example (7-8) - using the middle school example from method one above, the 1,000 student school would require 50 classrooms, based on the 1,250 student capacity divided by the 28 student per classroom capacity from the above table, and applying the 90% utilization factor (1,250 students ÷ 28 students per classroom ÷ .9 = 49.6 [50]).

As noted in the introduction to this section, the Guidelines specify the minimum number of square feet of classroom space required per student. The total number of classrooms calculated by this method must at least equal the required square footage specified in the Guidelines.

High School Example (9-12) - using the high school example from method one above, the 2,000 student school would require 112 classrooms, based on the 2,660 student capacity divided by the 28 student per classroom capacity from the above table, and applying the 85% utilization factor (2,660 students ÷ 28 students per classroom ÷ .85 = 111.8 [112]).

As noted in the introduction to this section, the Guidelines specify the minimum number of square feet of classroom space required per student. The total number of classrooms calculated by this method must at least equal the required square footage specified in the Guidelines.

2. Libraries and Media Centers (Guidelines Article 4)

A school facility is required to have space for students to access research materials, literature, non-text reading materials, and technology. Space must be provided for reading, listening, and viewing these materials. Section R7-6-401 provides the size of the library/media centers as follows:

Grade Configuration	Size
K-12 under 150 students	contact SFB liaison
K-6 over 150 students	greater of 1,000 sq. ft. or 20 sq. ft. per 10% of number of students

7-12 over 150 students	greater of 1,200 sq. ft. or 20 sq. ft. per 10% of number of students

The size of the library/media center for grade configurations which overlap the above categories (such as K-8 or 6-8) should be prorated to the correct size based on the above table.

Article 4 provides that every school facility shall have library materials in accordance with the Libraries and Media Centers/Research Area section of the Equipment List. Article 4 also provides that every school facility that serves over 150 students shall have, in addition to the library materials, library fixtures and equipment in accordance with the Equipment List. The library fixtures, equipment and materials list includes:

- one linear foot of library book shelves per student
- for a school of 150 or more, 1 work surface for every 20 students, with a minimum of 15, and a maximum of 75 (there may be more than 75 work surfaces, but 75 is the maximum that are required under the guidelines)
- for a school of 150 or more, 1 seat for every 20 students, with a minimum of 15, and a maximum of 75 (there may be more than 75 seats, but 75 is the maximum that are required under the guidelines)
- one TV/VCR
- one overhead projector
- ten books per student
- one almanac (either electronic or hard copy)
- one encyclopedia set per 200 students (either electronic or hard copy)
- one atlas (either electronic or hard copy)
- one unabridged dictionary (either electronic or hard copy)

3. CAFETERIAS (GUIDELINES ARTICLE 5)

Every school facility, regardless of the grade configuration, shall have a covered area (exterior space) or interior space, or a combination of exterior and interior space, to permit students to eat within the school site, outside of general classrooms. This space may have more than one function and may fulfill more than one guideline requirement (i.e. - physical education, auditorium, multi-purpose room, etc.).

While not specifically provided for in the Guidelines or the Delineation Document, it is generally recommended that the cafeteria space be large enough to accommodate a minimum of 1/3 of the design capacity of the school at one time for a maximum of three serving periods. At least 10 square feet per student for

the number of students to be served at one time should be allocated for this function.

Article 5 also provides that every school facility shall have space, fixtures and equipment, in accordance with the Food Service section of the Equipment List, for the preparation, receipt, storage and service of food to students. This kitchen space shall be accessible to the serving area, and shall be appropriate for the food service program of the school facility.

Food service fixtures and equipment are to include at least one of each of the following:

- three-compartment sink
- double stack convection oven for a cooking kitchen, or a warming oven for a serving kitchen
- dishwasher (if reusable dishes and silverware are used)
- hot food holding appliance
- range with hood
- refrigerator
- freezer
- milk refrigerator

4. Auditoriums and Other Multi-use Space (Guidelines Article 6)

Every school facility, regardless of the grade configuration, shall have a space capable of being used for student assembly sufficient to accommodate 1/3 of the design capacity of the school. The space shall have a minimum of 7 square feet per student for 1/3 of the design capacity, and shall be at least the same size or larger than an average classroom at the facility.

This space may have more than one function and may fulfill more than one guideline requirement (i.e. - cafeteria or indoor physical education).

5. Science, Art, Vocational Education and Physical Education Space (Guidelines Article 9)

A. Science (Guidelines Section R7-6-901)

A school facility with students in grades 5-12 shall have classroom space to deliver either practical science instruction or an alternate science delivery method.

For grades 5-8, no space is required beyond the academic classroom requirement.

For grades 9-12, 4 square feet of space per student is required. The space shall not be smaller than the average classroom at the school facility, and the space may be used for other instruction.

If a school facility delivers practical science instruction, the facility shall have science fixtures and equipment in accordance with the Science Facilities section of the Equipment List as follows:

1) Grades 5-12

- one sink per 250 students
- one compound microscope per 25 students, with a minimum of the lesser of 12, or 1/2 of the number of eligible students
- one balance per 250 students

In addition to the above, science fixtures and equipment for students in grades 9-12 shall include:

2) Grades 9-12

- one demonstration table with a non-corrosive surface per 250 students
- six laboratory stations with a non-corrosive surface per 250 students
- one fume hood
- one chemical storage unit per 1,000 students
- one eye wash/shower per 250 students
- one dissecting microscope per 25 students, with a minimum of the lesser of 12, or 1/2 the number of eligible students
- one refrigerator

B. Art (Guidelines Section R7-6-911)

A school facility with students in grades 7-12 shall have space to deliver art education programs, including visual, music, and performing arts programs, or have access to an alternate delivery method for art education. The space shall have a minimum of 4 square feet per student, and shall be at least the same size or larger than an average classroom at the facility. The space is included in the academic classroom requirement, and may be used for other instruction.

Dedicated space to deliver art education programs is not required for grades K-6.

Note: the 4 square feet per student is a total for both art and vocational education, and is a minimum that can be split between the two program areas.

C. Vocational Education (Guidelines Section R7-6-921)

A school facility with students in grades 7-12 shall have space to deliver vocational education programs, or have access to an alternate delivery method for vocational education. The space shall have a minimum of 4 square feet per student, and shall be at least the same size or larger than an average classroom at the facility. The space is included in the academic classroom requirement, and may be used for other instruction.

Dedicated space to deliver vocational education programs is not required for grades K-6.

Note: the 4 square feet per student is a total for both art and vocational education, and is a minimum that can be split between the two program areas.

D. Physical Education (Guidelines Section R7-6-931)

A school facility shall have area and space for physical education activity, and space for a comprehensive health program established in compliance with the academic standards prescribed by the State Board of Education. The Delineation Document provides the size of the indoor physical education space as follows:

Design Capacity of School	Size
under 20 students	contact SFB liaison
20-50 students	one single space of at least 1,600 sq. ft.
50-125 students	one single space of at least 2,600 sq. ft.
more than 125 students	total space at least 5,100 sq. ft., with one single space of at least 2,600 sq. ft.

This space may have more than one function and may fulfill more than one guideline requirement (i.e. - cafeteria or auditorium).

The Equipment List also provides that, in addition to the indoor physical education space, a school facility shall have, exterior to the building, one basketball court size surfaced area with two goals per 300 students, with four courts the maximum required (a facility may have more than four courts, but four is the maximum that are required under the guidelines).

The Equipment List also provides that a school facility shall have at least one baseball/softball backstop exterior to the indoor physical education space.

6. Other Facility Areas (Guidelines Article 10)

A. Parent Workspace

If parents are invited to assist with school activities, a school facility shall include a workspace capable of being used by parents. If this space is provided, it shall consist of 1 square foot per student, with a minimum of 150 square feet, and a maximum of 800 square feet (it may exceed 800 square feet, but 800 square feet is the maximum that is required). The space may consist of more than one room, and may have more than one function.

B. Administrative Space

A school facility shall have space for the use of the administration of the school. The space shall consist of a minimum of 150 square feet, plus 1.5 square feet per student, up to a maximum of 2,500 square feet (it may exceed 2,500 square feet, but 2,500 square feet is the maximum that is required).

C. Student Health Space

A school facility shall have space to isolate a sick student from the other students. This space shall be a designated space that is accessible to a restroom, and large enough to accommodate one cot per 200 students, with a maximum of 4 cots (there may be more than 4 cots, but 4 cots are the maximum that are required).

D. Faculty Workspace

A school facility shall have work space available to the faculty which is in addition to any work area available to a teacher. The space shall consist of 1 square foot per student, with a minimum of 150 square feet, and a

maximum of 800 square feet (it may exceed 800 square feet, but 800 square feet is the maximum that is required). The space may consist of more than one room, and may have more than one function.